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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/973,849	10/10/2001	Ramkumar Subramanian	E0797	7129

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EXAMINER

DAVIS, WILLIE L

ART UNIT PAPER NUMBER

2877

DATE MAILED: 06/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/973,849

Applicant(s)

SUBRAMANIAN ET AL.

Examiner

Willie Davis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 6-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-6 are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

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## DETAILED ACTION

### *Election/Restrictions*

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-5(Group I), drawn to method of developing a photoresist, classified in Class 430, subclass 322(process claims)

II. Claims 6-23(Group II), drawn to an apparatus for monitoring development, classified in Class 356, subclass 300+(device claims).

During a telephone conversation with Gregory Turocy on June 12, 2003, a provisional election was made without traverse to prosecute the Group II(claims 6-23).

Claims 1-5 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

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The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 6-10 and 13-23 are rejected under 35 U.S.C. 102(e) as being unpatentable over Rangarajan et al.

***Claim 6,***

Rangarajan('013) discloses a system of monitoring development of a selectively irradiated photoresist material layer comprising: a light source irradiating a photoresist layer(see column 5, lines 25-28), a detector disposed near the photoresist layer and detector adapted to receive a reflected ray of light and provide a signal corresponding to the intensity of reflected ray of light(see Figure 2), a measuring system coupled to a detector, the measuring system adapted to receive the signal corresponding to the intensity of the ray of light and convert the signal to digital data(see column 5, 28-65) and a processor coupled to the measuring system, the processor adapted to receive digital data from the measuring system(see column 5, lines 51-65).

Rangarajan('013) measures the varying ratio of the solvent/resist mixture. Although the applicant measures the amount of water, the Examiner sees the measurement of water as equivalent to the measurement of a solvent/resist mixture. A solvent/resist mixture contains water, acid and other compounds(see column 6, lines 18-35).

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***Claims 7-10,***

Rangarajan('013) discloses that any suitable interferometry system or spectrometry system may be employed as a measurement system for this type of monitoring system(see column5, lines 42-50) Suitable spectrometry system or interferometry system includes laser doppler anemometry, interferometry, in-situ laser scattering and spectrometry.

***Claim 13,***

Rangarajan('013) discloses a controlling development of a selectively irradiated photoresist layer wherein system comprises a nozzle adapted to contact photoresist layer with a volume developer,(see column 6, lines20-23), coupled to the measuring system relating to amount of solvent and using data to provide adjustment information to the developer volume and concentration control system so that photoresist layer development can be achieved(see column 6, lines 19-34 ahnd Figure 2).

***Claim 14,***

Rangarajan('013) discloses that any suitable interferometry system or spectrometry system may be employed as a measurement system for this type of monitoring system(see column 5, lines 42-50). Suitable spectrometry system includes in-situ laser scattering system, laser doppler anemometry system, interferometry system and spectrometry system.

***Claims 15 and 16,***

Rangarajan('013) discloses a developer volume and mixture control system wherein the system adjusts the concentration of the developer by varying the amounts of solvents(concentrated developer and water) in the mixture(see column 6, lines 19-34).

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***Claims 17 and 18,***

Rangarajan('013) discloses an electronically controlled valve that controls the flow of developer and solvent(water) wherein mixing chamber and electronically controlled valve are disposed inside the nozzle.(see Figures 2 and 4a).

***Claim 19,***

Rangarajan('013) discloses a system of developing a photoresist layer on a semiconductor layer wherein the system comprises a means for contacting the photoresist layer with a volume developer (see column 6, lines 18-35), whereby the developer and solvent(acid) in the photoresist layer interact to generate an amount of solvent(water) and means for measuring the amount of solvent(water) and means for measuring the amount of solvent(water and acid){see Figure 2}.

***Claims 20-23,***

Rangarajan('013) discloses a system for adjusting the concentration and volume of the developer based on the determined solvent (acid) consumption including means for adjusting the contact time and means for controlling the applying developer(see Figure 2 and column 6, lines 19-34).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rangarajan('013).

Rangarajan('013) discloses the claimed invention except for the display. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Rangarajan('013) with the display since it was known in the art that displays are used to display measurement data for a user for verification.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rangarajan('013).

Rangarajan('013) discloses the claimed invention except for one light source directed to an area of a photoresist and one detector disposed at a location adapted to receive reflected light due to the light source(see Figure 2).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine Rangarajan('013) with the added light sources and detectors since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art.(St. Regis Paper Co. v. Bemis Co., 193 USPQ 8). The combination would allow for an increased amount of detection data.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Willie Davis whose telephone number is 703-305-5169. The examiner can normally be reached on 9:30am-6pm


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on 703-308-4881. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-0956 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-7722.

*Willie Davis*

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June 17, 2003

  
**Michael P. Staffira**  
**Primary Patent Examiner**  
**Technology Center 2800**



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